ELECTRICITY on the FARM

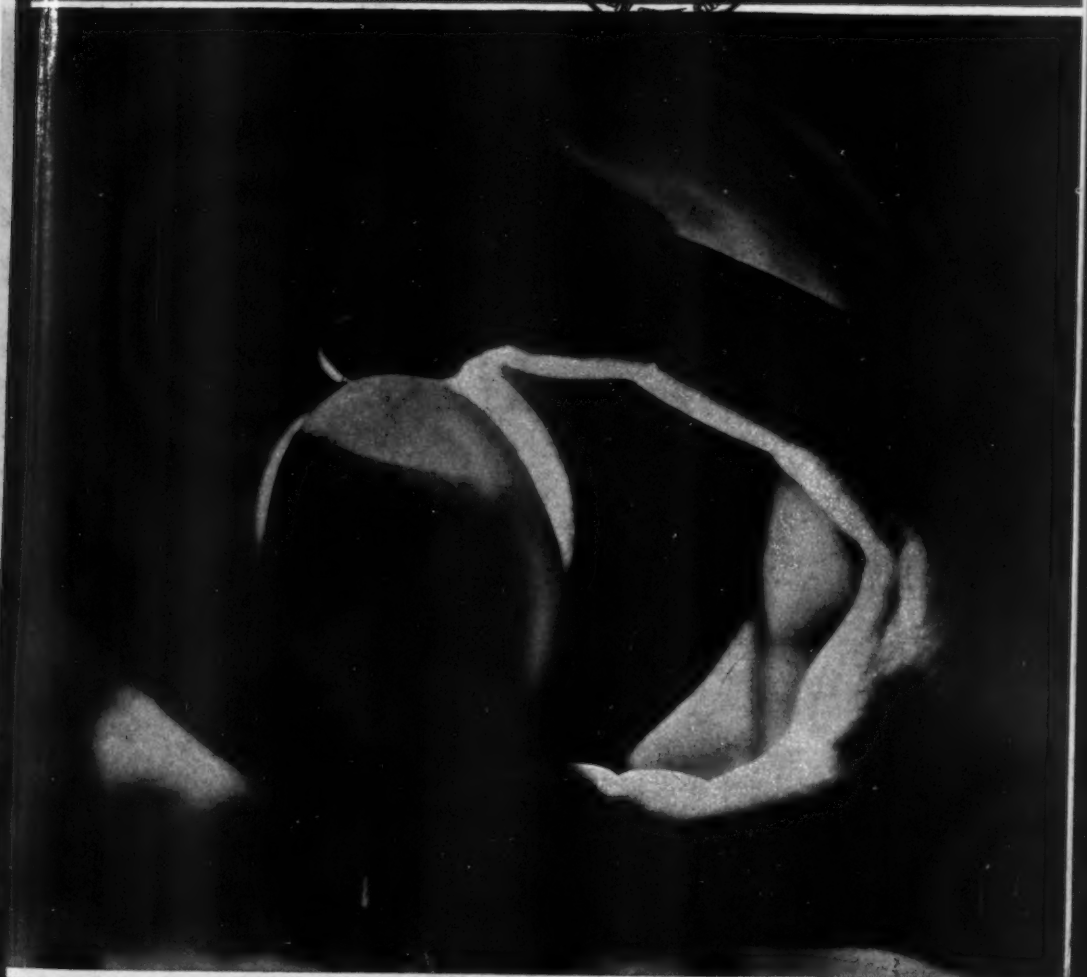
The National Magazine of Rural Electrification

JUNE, 1943

THIS MONTH—

Irrigation of Farm Gardens
What Happens to a Warm Egg
How to Clean Electric Motors
Victory Garden Storebox Drier
Farm Food Preservation Center
Evaporative Egg Coolers
Milk Cooler Boon to Dairymen
Saving Foods in a Refrigerator
Recipes Using Honey Sweetening

JUN 10 1943



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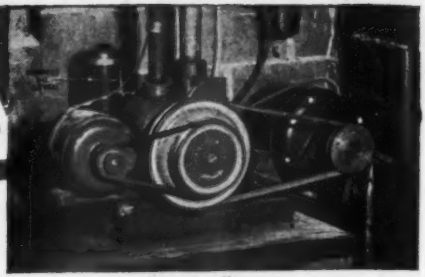
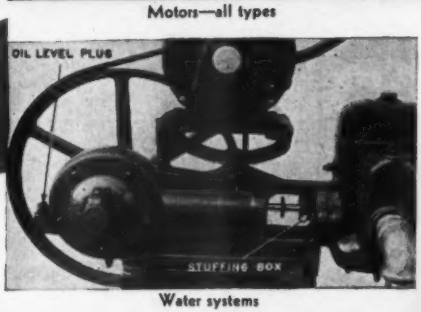


Motors—all types



Water systems

Milkers, coolers, clippers, etc.

Brooders, hovers, lighting

In graphic pictures like these →

Specific facts—in clear, graphic detail—on the care of farm equipment. Material and entertainment for your 4-H club, farm program, or Grange meeting—build your evening around it, make it the basis of a good discussion, and an opportunity for exchange of short-cut, farm-maintenance ideas.

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"The Care and Maintenance of Electrical Farm Equipment," can be obtained from your farm representative, County Agent, or the rural representative of your electric-service company. If, for some reason, they are unable to supply the film—mail this coupon to us and we will make the necessary arrangements for you to get it. If you would like to buy the film, film strip and sound record are sold for $3.00; the film—with mimeographed script-copy included—$1.00. To order, simply mail this coupon to General Electric, Schenectady, N. Y.

GENERAL ELECTRIC

General Electric Company, Section 303-11A
Schenectady, N. Y.

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THE BIGGEST JOB Your Milker Ever Had

WITH milk desperately needed to protect the health of a food-rationed nation, your McCormick-Deering Milker has an important time-saving, labor-saving job to do in the summer months ahead.

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Keep your McCormick-Deering working at top-notch efficiency. Follow these conservation suggestions:

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McCORMICK-DEERING

Editor's Chat

THE ROCKS

Last night (May 2nd) the President of the United States appealed over the radio to the coal miners to continue to produce coal. Labor unionism is close to the rocks of public disgust; and the swaggering pilots still defy the elements.

Ernie Pyle writes from North Africa: "You just mention a strike at home either to a soldier or officer, living on monotonous rations in the mud under frequent bombing, and you've got a raving maniac on your hands." Those boys can fight, and some day they will vote.

Motivated by arrogance, selfishness and lust for power, labor leaders have been willing to flout the Nation's welfare, give comfort and aid to our enemies and gamble away the ultimate interests of the very laborers they are supposed to represent. I cannot believe that these petty dictators truly represent the will of the laboring men. In the end, the laboring man is the one who will suffer.

Labor needs organization; it needs mutual cooperation for the betterment of working conditions, the improvement of living standards, for the guarding of its common interests. To reach these goals and maintain its position, it cannot be a blind bully. It must give some consideration to the well being of the public generally and must put country before self. There are such unions. They are honest and democratic in action and organization. They cooperate with management and capital in improving conditions and developing markets. Everyone benefits. In addition to higher wages and better living, there is an inner satisfaction in having contributed to the welfare of the community and the Nation. The public welcomes these unions and is proud of their contribution to the American way of life.

In contrast to these constructive unions, there has grown up in this country in the name of labor a system of vicious dictatorships which have taken liberty and freedom from the laboring man and have brow-beaten the public, with the collaboration of a government, itself striving for power and perpetuation. These little dictatorships are the nearest approach to Hitlerism and Jap arrogance we have in this country. People follow strong leadership, *good or bad,* in this country the same as they do in Europe and Asia. Dictator union members have been schooled in discontent, hate, featherbedding, and the almighty right of the union dictator, just as Hitler youth have been trained. There have been too many "Munichs" in this country.

We talk about re-educating the German youth when victory is won. We have a plenty tough training job at home right now in re-educating the disciples of dictatorship to the fundamentals of democracy and the principles of Christianity based on the Golden Rule.

AFTER THE WAR

Our job right now as farmers is to save our skin and that of our country by helping in every way we can to win the war. That means produce food, buy bonds, deliver scrap, save rubber and gas, and "keep our shirts on" and our minds active. Does it also mean to do some thinking and planning for what we want after the war is won? I believe so. The reason we are so long winning the war is because we had not thought and planned for it before it came. The peace can be the same way.

What do you as a farmer want after the war is won? If farmers do not know, who does? Do you want world competition, free trade, new industrial crops, restricted immigration, a regimented agriculture told what and how much to grow and where to sell? It is very easy to succumb to "benefit payments" and paternalistic plans. Someone must plan. If you do not, you will get what the other fellow thinks is good for you (or him).

It is not too early to discuss post war problems in your Grange, Farm Bureau and community meetings. I have no plan—only if we want a virile agriculture, farmers must think and do their own planning. They must do it with consideration for other groups; not selfishly. Is it too much to suggest that in planning, Agriculture should have in mind what it can do for this country of ours rather than what the country can do for Agriculture? The one who *does the doing* usually benefits most.

THANKS, GOD!

The season is nearly half over. Thanks, God, for the victories our boys have won; for health, a free country, for growing crops, and the privilege of doing my part in re-establishing right and happiness in the world. I'm still working.

Geo. W. Kable

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★ WARTIME STRATEGY ON THE FARM ★

Electricity . . . the hired hand that saves you time, labor, and money!

Dairymen all over America are finding new ways to put their present electrical equipment to work—producing *more* and *better* dairy products to meet wartime demands.

With manpower growing scarcer every day, they are discovering new *time, labor, and money saving applications* for portable electric farm motors—operating cream separators, churns, feed grinders, ensilage cutters, hay hoists, and other dairy equipment.

If your farm motor is *not* of the portable type, it can easily be converted—so you can move it about, from job to job, on your farm.

Westinghouse will be glad to send you the free "Farm Motors" book which tells how to make small and large electric motors portable—and describes the selection, care, and use of farm motors.

This helpful book is yours for the asking. *Just sign and return the coupon!*

Westinghouse Electric & Manufacturing Company, Pittsburgh, Pennsylvania. Plants in 25 cities; offices everywhere.

ELECTRIC MILKING MACHINE *saves 150 man-hours of labor per month for every 50 cows milked. Think what this means, today, with farm help scarce, and getting scarcer!*

POWER HAY HOIST. *With a portable electric motor on the job, only one man is needed for hoisting hay. Saves you time for more important work on the dairy farm.*

Here are some of the things a nickel's* worth of electricity will do on a dairy farm:

- Shell 20 to 30 bushels of corn.
- Cut and elevate one ton of silage.
- Grind 100 to 500 pounds of grain, depending on kind and fineness of grinding.
- Milk 20 to 25 cows with a portable milking machine, or 10 to 15 with a pipeline machine.
- Pump 1000 gallons of water.
- Cool 100 pounds of milk.
- Separate 2000 pounds of milk.

**Based on 5-cent per kwh rate. If you use enough electricity to earn a lower rate, your nickel buys even more!*

FREE—Send for "Dairy Cattle" Farm Bulletin, describing short cuts and time and labor saving uses of electricity on the dairy farm. This is one of 12 free Farm Bulletins Westinghouse offers to farmers to help them win the Battle of Food Production. Use coupon below.

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Westinghouse Electric & Manufacturing Company, (Dept. EF-63) Rural Electrification, 306 Fourth Avenue, Pittsburgh, Pa.

Please send me the free copy of "Farm Motors" booklet ( ) . . . also free Farm Bulletins on the application of electricity to the subjects checked below.

☐ Poultry ☐ Beef Cattle ☐ Cooking, Canning, and Preservation of Food
☐ Clothing ☐ Crops ☐ Dairy Cattle ☐ Sheep ☐ Home Improvement
☐ Swine ☐ Rural Electrification ☐ Handicraft ☐ Truck Gardening

Name.....

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FARM GARDEN IRRIGATION

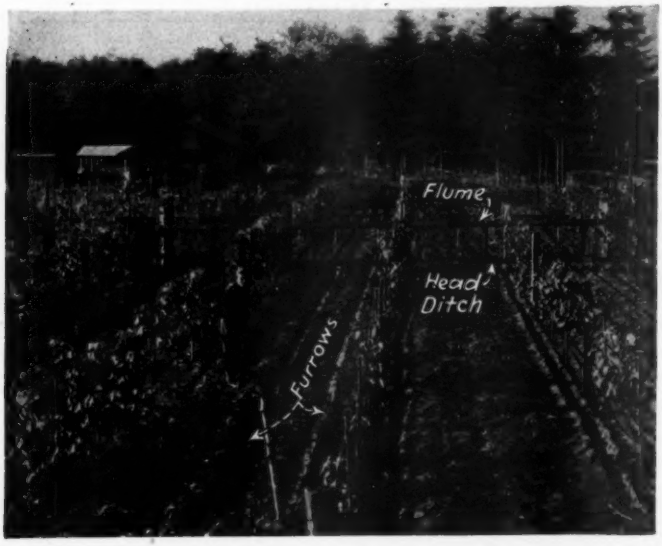
By I. P. BLAUSER
Agricultural Engineer, Ohio State Univ., Columbus, Ohio

FARM gardens along with Victory Gardens this year are going to be very important. Their successes or failures are sure to have considerable effect upon how well people on the home front eat this year. Much of our regular production will be needed for our armed forces, our allies, and for the devastated countries.

Irrigation Good Investment

Even in peace time, farm gardens, if carefully planned and properly cared for, have generally been a worthwhile investment of time and labor. Too frequently, however, farm gardens produce only fair results, or are almost complete failures because of insufficient rainfall or uneven distribution. It is imperative that maximum results from these gardens be secured this year. There are very few years when both the quantity and distribution of rainfall is such that supplemental water will not increase total production or improve quality. Commercial vegetable growers know the importance of irrigation and consider the investment in equipment, even though not used fully every year, an insurance against crop failure due to lack of moisture at the right time.

Irrigation for the farm garden is just as important as it is for commercial production if best results are to be secured. These gardens require seed, fertilizer, and labor, which may not be profitable or satisfactory expenditures unless provision is made for irrigation. Plans to supply supplemental water should be worked out well in advance of the time when it may be needed, because once the crop is suffering from lack of moisture irreparable damage may be done before water can be applied. Many farms already have equipment on hand, or can easily assemble materials needed to do a satisfactory job of garden irrigation. If equipment must be purchased, it should be secured early, for even though irrigation pumps and equipment are not rationed at the present time, purchase certificates are required for some of the equipment.



Furrow irrigation. Water is brought to this garden in wooden troughs or flumes shown crossing the center of the garden. It is let into the head ditch under the flume by pulling out a plug. From the head ditch, the water is fed into the furrows with a hoe or shovel. This system is inexpensive and effective for row crops where there is a good water supply, a slight grade to the soil so the water will flow without washing and where the soil is not so sandy that the water will all sink away in one place. In good loam with a 1% to 3% slope, the furrows may be 200 ft. long.

Irrigate Before Crop Suffers

To be effective, irrigation must be adequate, applied properly, and the soil must be fertile. Irrigation to be most successful must be applied before the crop is suffering from the lack of moisture. The two general types of irrigation that may be used for gardens are overhead irrigation and surface irrigation. The overhead irrigation may be with an overhead pipe with fixed spray nozzles generally known as the Skinner system, or by revolving sprinklers. Surface irrigation may be by furrows if the surface is level enough or the planting done on contours, or by porous canvas hose. Furrow irrigation where it can be used will probably be the most economical. Overhead irrigation more nearly resembles rainfall, and can be used any place regardless of the slope. The type of system to be used will be determined by the conditions, and also by the equipment already on hand or which can be readily secured. Every effort should be made to use equipment already on the farm such as hose, sprinklers, used pipe, and even V-shaped wooden troughs made by nailing two boards together.

Use Plenty of Water

Probably the most important things to keep in mind about irrigation are the rate of application and the total amount of water to apply. Most gardens that are primarily for family consumption will be from 1/5 to 1/10 acre in size. For optimum vegetable

Right: "Skinner system" of pipe sprinklers on Purdue University gardens. The pipe is drilled and tapped every three feet for very small nozzles. The pipe has a flexible connection at the end and is supported on posts 2 ft. to 6 ft. high so that it may be turned occasionally by hand or rotated continuously by a special oscillator driven by the water. At 40 lbs. pressure each nozzle will deliver about 12 gallons per hour.

Below: Rotating sprinkler system. Sprinkler heads range from the ordinary lawn sprinkler to special irrigation heads which cover up to a 90-ft. circle and put on 15 to 20 gallons of water per minute. Large sprinklers are being used with portable slip-joint pipe on this western potato field. Lawn sprinklers will do a satisfactory job on gardens, but be sure to leave them in one spot long enough to wet the soil thoroughly.

growth, the soil should receive one inch of water per week either from rainfall or irrigation, separately or combined. An inch of water over an acre is approximately 27,000 gallons, which would be 5,400 gallons per 1/5 acre and 2,700 gallons for a 1/10-acre garden. The water should be applied no faster than it soaks into the soil, and that is true regardless of the method of application. To apply water faster than the soil will take it will not only waste water, but will puddle the soil and waste plant food as well. If furrow irrigation is used, extra care must be taken to see that water is supplied in large enough quantities so that water travels the full length of the furrow, and does not sink away in one or two spots.

Most farm water systems that would be used for garden irrigation have a capacity of from 250 to 500 gallons per hour. Since the water system also furnishes the water for the other farm and home needs, the full capacity of the pump can not be used for irrigation purposes, unless it is done at a time when there are no other demands. A 500-gallon per hour pump, if used entirely for irrigation, would supply an inch of water to 1/10 acre in about 5½ hours, or one inch to 1/5 acre in about 11 hours. If only 300 gallons per hour are available for irrigation, then 9 hours and 18 hours would be required to supply an inch of water to 1/10 and 1/5 acres respectively.

Overhead Irrigation Requirements

For overhead irrigation, about 3½ to 4 gallons of water per minute at 30 to 40 pounds pressure per square inch are required for each 50 feet of pipe. The width covered is from 50 to 60 feet wide. The length of the pipe must be matched with the capacity of the pump, and then moved from place to place to give complete coverage. A garden 85-ft. by 100-ft. is approximately 1/5 of an acre. An overhead pipe line 85-ft. long requiring between 6 and 7 gallons per minute or 360 to 420 gallons per hour would cover half of this size garden at a time.

Rotary sprinklers are available which require 150 gallons per hour or less, and give coverage up to 60 feet or more in diameter. Here again, it is necessary to keep moving the sprinkler until the entire garden is covered. Ordinary rotary lawn sprinklers may be used with fair success, especially if placed on a pipe standard 2½ to 3 feet high.

Furrow Should Have Slope

In furrow irrigation, the water should be applied in narrow furrows in quantities such that some water moves the full length of the furrows, but not more than the soil will take up. Wooden troughs may be quite useful in carrying water to the garden from the pump. A slight, uniform slope is desirable for surface irrigation. More care is generally required for surface irrigation, if the water is to be uniformly distributed, unless the conditions and soil are ideal for that type of irrigation.

Another thing that needs to be checked before plans are completed, is the water supply. Be

sure that the available supply is sufficient to meet the needs. Some gardens may be located at some distance from the pump; if so, check to see that the pipe size is large enough to prevent excessive loss of pressure.

Since the capacities of farm systems are not large, it may require considerable time to cover the entire garden. Remember one heavy application is much better than a number of light ones, even though the total amount of water put on the garden is the same in each case.

Victory Garden Drier

THE little drier described in this article was developed by B. H. Standley of the Houston, Texas Lighting and Power Co. It is not claimed to be the fastest or most efficient fruit and vegetable drier, but it is one of the cheapest and easiest to build, and it does a pretty good job of drying. Furthermore there are no materials in it, except the screen wire for trays, that are not available on most farms.

Made from Apple Boxes

The drier shown was built from three apple boxes. Two were spliced together as shown to make the drier cabinet, and the third was used to make the door, slides and trays. One end was removed from each of two of the boxes, and they were placed one on top of the other and nailed to an inside cleat which held them together. Five trays were provided, with slides 2½" apart.

In order to keep the heat inside the drier and passing up through the trays, the inside was lined with corrugated board from packing cartons. Several thicknesses were used and the joints lapped so there would be no cracks in the corners or through the sides. The corrugated board was tacked to the inside before the tray rails were nailed in place. The top of the box was not lined.

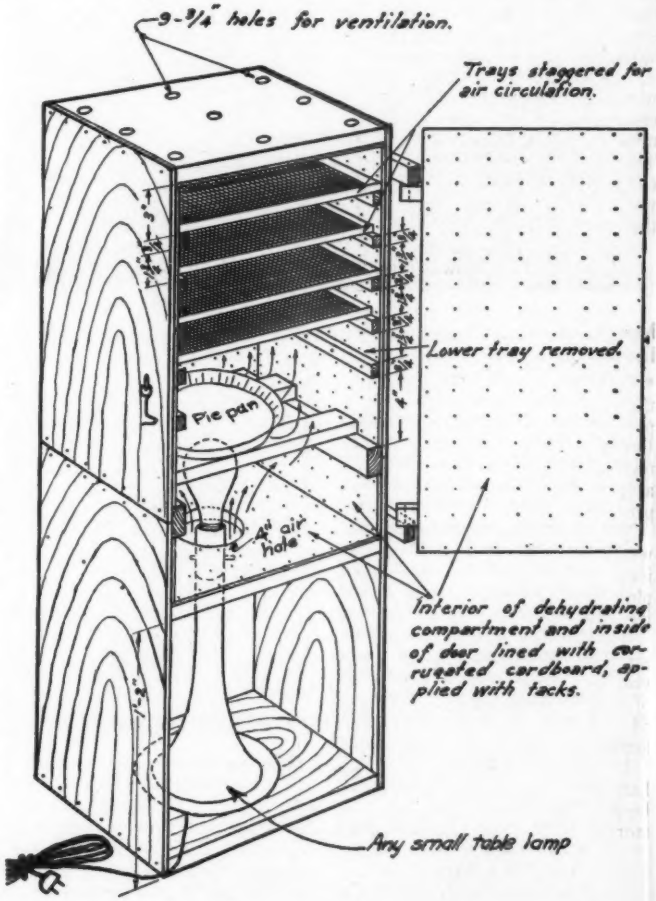
200 w. Lamp for Heater

The heating element is a 200 watt bulb in an ordinary table or desk lamp. If no table lamp is available the bottom could be raised and a porcelain receptacle fastened to it. A 4" hole was made in the bottom of the drying compartment to let in fresh air, and 9-¾" holes were bored in the top to let out the moist air. Note how the trays are staggered so the air can get back and forth over them when the trays are loaded. The tin pie pan over the lamp distributes the heated air and prevents having a hot spot in the center of the bottom tray. It would be better to support it on two wires or rods in place of the wood strips.

The trays were made of half inch strips sawed from the extra box, and are covered with ⅛" mesh hardware cloth or galvanized window screen. They should be ¼" smaller than the box so they will slide in easily.

Make the door from the boards in the third apple box. Line it with corrugated board and make hinges out of strips sawed from the box ends. A nail through a hole drilled in the end of each strip forms the hinge.

Preheat the drier before putting in the vegetables. Follow recommended preparation methods and drying temperatures in so far as possible. You can use different size bulbs to get different temperatures. Interchange the trays every hour or two to get uniform drying.


9-¾" holes for ventilation.
Trays staggered for air circulation.
Lower tray removed.
Pie pan
4" air hole
Interior of dehydrating compartment and inside of door lined with corrugated cardboard, applied with tacks.
Any small table lamp

Electric Milk Cooler A Boon to Dairymen

Made Real Money on Grade A Milk; Stored Fresh Meat; Qualified as Raw Milk Producer; Saved Cooking for Ice-Cutting Crew. Some Additional War Contest Letters

Combination Cooler Serves Dual Purpose

• I have had a combination milk cooler for two years and ten months. It cools four 10-gallon cans of milk at one time and also has a dry side that will hold 60 quarts of bottled milk.

It costs about $5 per month for electricity to cool about 45 gallons per day in cans and to store the dry side full of bottled milk. It takes about 160 kw-hrs per month. On the other hand we get 10c per hundred extra for milk that will pass as grade A, and since I have had the cooler, I have never failed to get grade A.

The time saved each day, I would say, is about 30 minutes in cooling the milk and 20 to 30 minutes on washing the old cooler. The only expense other than for electricity in the nearly three years, has been new brushes for the motor.

PAUL LANGENBERG,
R 5, Iowa City, Ia.

Most Profitable Farm Investment

• Our milk cooler, which is of the cabinet type, is the most profitable investment on our farm. Because it has lowered the bacteria count of our milk, it has enabled me to qualify as a raw milk producer and dealer.

The cooler has saved me the wet, laborious task of handling ice and hours spent in hauling it, plus a saving of $2 per day on ice bills.

The electric method nets me a saving of approximately $684 per year. The difference in the quality of milk brought me $1 per cwt or $4 per day — a considerable amount in the past seven years.

I find that fresh meat can be had at all seasons by cutting up beef or pork butcher style and storing it in cans in my cooler.

J. M. DENSON,
Rt 1, Helena, Alabama

Saves Cooking for Ice-Cutting Crew

• Opportunity knocked at our door last November and we bought an almost new six-can electric milk cooler. It has given wonderful satisfaction in the saving of time, labor and money. It cools the milk from top to bottom of every can to below 50° in less than an hour. One-half hour's time is saved each day, besides doing away with the labor of digging out ice, washing and loading it on a cart and drawing it out to the milk room.

Then, it eliminates the work of cutting ice, always a two-day job with a crew of 12 men. Filling the ice house cost $50 each year and there were two big dinners to prepare for the hard working men.

The cost of operating the cooler is less than 40c a day.

MISS SUSAN L. BROWN,
R D 1, Walden, N. Y.

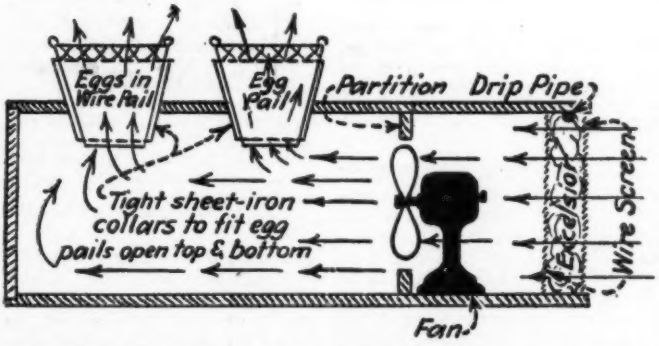
Furfural, a farm by-product made from corn cobs, oat hulls, cotton-seed hulls and other waste products has been recognized by WPB as a critical war material. It is used in making butadiene for synthetic rubber.

I would I were beneath a tree
A-sleeping in the shade
With all the bills I've got to pay,
Paid.

I would I were beside the sea,
Or sailing in a boat,
With all the things I've got to write,
Wrote.

I would I were on yonder hill
A-basking in the sun,
With all the work I've got to do,
Done.

—Anonymous.



Evaporative Egg Cooler. Make a wooden box 18" square and 54" long, inside dimensions. The box must be *air tight*, except that one end is left open and there are two openings in the top in which to place two egg collecting pails. If solid sided pails with wire bottom are used for eggs, just cut the hole to fit the pail and line the inner edge with a gasket so air cannot leak by. If wire baskets are used, then a metal collar the shape of the pail must be placed in the hole so the air will be forced up through the eggs from the bottom. The evaporative unit is 3" thick, filled with excelsior and held in place on both sides with hardware cloth. It must fit tight against the open end of the box so the air will be drawn through the wet excelsior. A tight partition of plywood should be placed about 15" in from the excelsior with a hole sawed in it just large enough so the fan blades will clear. The air then comes in through and is cooled by the wet excelsior and is blown out through the eggs. The excelsior may be kept wet by a small copper pipe with about 15 1/32" drip holes punched in it. The drip can be controlled by a stop cock. An 8", 10" or 12" fan may be used. If you wish to substitute a water-cooled car radiator or an ice compartment for the evaporative cooler, the fan section of the box would need to have sides sloping up to the size of the radiator or ice box.

HOW TO CLEAN ELECTRIC MOTORS

(In Two Parts—Part 1)

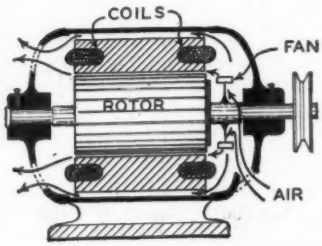
By DR. FORREST B. WRIGHT
Agricultural Engineer, Cornell University, Ithaca, N. Y.

PREVIOUS articles in this magazine have emphasized the importance of correct oiling of electric motors. The next most important thing that all of us can and should do is to keep our motors clean.

Dust blankets this motor like an overcoat causing it to get hot. Dust, lint and cobwebs also obstruct the air passageways through the end shields so the cooling fan inside the housing cannot function properly.

Dirt on most any machine is destructive and on electric motors it may be especially so, because in addition to the usual wear and general deterioration, dirt may do further damage by causing a short circuit or overheating of the motor. A motor generates heat when it is working. Unless this heat is removed, the temperature of the motor will rise until the motor is burned out. Normally, most of the heat is removed by air blown through the motor. Although some motors are completely enclosed and are cooled entirely by radiation, most motors have openings in the end shields to permit the circulation of air. Motors which drive direct connected fans and blowers may depend upon the fan or blower to circulate the cooling air. Otherwise, there is a small fan mounted on the shaft on the inside of the motor which is for the express purpose of circulating the cooling air.

If the air passages through the end shields and on the inside of the motor become filled with dust, lint and cobwebs, the flow of cooling air will be reduced and the temperature of the motor will rise. Oily or gummy dirt lodged on the fan blades may considerably reduce the effectiveness of the fan. It is the same as having a blanket placed over the radiator of a car. Also, a thick layer of dirt on the outside of the motor acts as insulation and reduces the amount of outside cooling.



Most standard motors have fan cooling systems. This diagram shows how air is drawn in through one end shield, forced through the windings and out the other end shield.

In addition to the effect on the cooling of a motor, dirt and gum in the bearings and on the other working parts may cause them to wear out quickly or cease to function. Oily dirt, dust from grinders, or metal chips from drills lodged in the windings may eventually cause a short circuit.

The best way to avoid damage by dirt is of course, to keep the motor from getting dirty. Naturally, the cleaner the air in which a motor operates the less dirt it will accumulate. The first rule then for keeping motors clean is to operate them in a clean place. This is not always possible, but the motor can be located on a machine or in a room so that it is exposed to a minimum of dirt. For example, motors on dirty machines such as saws or feed grinders can be protected by shields for deflecting the heaviest of the dust away from the motor, or sometimes in a dusty room the motor can be located where its cooling air can be drawn from outside of the room. One thing to be careful about in using shields or covers for motors is not to cut off the supply of air or to insulate the motor in any way. Remember that cooling air must get to the motor. In this connection it might be mentioned that a motor should not be installed in a hot place unless it is especially designed for such a location.

Dirt Eventually Gets Inside

We can protect our motors as much as possible from dirt and can easily keep the outside clean, but eventually, even with the best of care, they will become dirty on the inside, especially if oil has been leaking out of the bearings. Motors in this condition should be taken apart and thoroughly cleaned.

Ordinarily, it is best to have motors cleaned at a motor repair shop. However, at the present time, these shops are often so rushed with work that it takes a long time to get the motor cleaned and back in service. If the job can be done at home the motor can be put back in service within a few hours.

Although the job should not be undertaken by an inexperienced person, any one who is handy with tools and has had some experience in working on machinery can, by carefully following the instructions given here do a successful cleaning job.

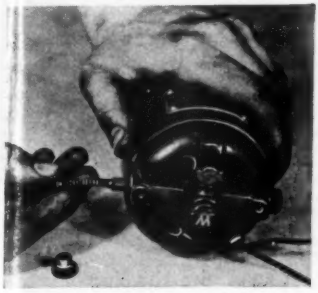
To Open the Motor for Cleaning

1. Disconnect the motor from the electric circuit. (Detach the

cord, turn off the switch, remove the fuses or disconnect the wires.) Do not work on a "live" motor.

2. Unless the motor is easily accessible on its present mounting, remove it to a convenient working space.

3. If the outside of the motor is dirty, wipe it clean.



A brush and its holding spring being removed from a small motor. Be careful it does not jump out and get lost when you remove the cap screw. The brush itself is of carbon. The spring slips over a rounded end. Be sure to put it back in the same position it comes out so it will fit the curved commutator.

4. If the motor has brushes removable from the outside, remove them one at a time, wipe them clean, and mark them "left" and "right" so that they may be replaced in their original position. When removing the brushes, take care that the brush springs do not pop out and become lost.

5. At this point examine the end play on the rotor. To do this, push and pull endwise on the rotor shaft. If there is as much as 1/32" end play, new fiber spacer washers may need to be added when the motor is reassembled.

6. Mark the position of the end shields before removing them.

7. Observe how all parts are assembled before removing them so that they may be correctly replaced.

8. Remove the pulley.

9. If there are any burrs on the shaft remove them with a mill file so that the bearing will not be damaged as the end shield is slipped off.

10. Remove the end shield screws or bolts.

11. Loosen the end shields as shown in the illustrations.

12. As the end shields are removed be careful not to break wires or switch parts.

13. Remove the rotor.

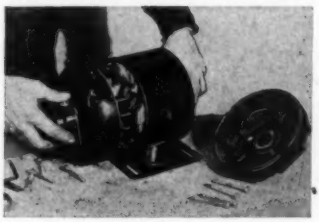
14. Be sure that all of the fiber spacer washers are on the shaft at each end. Sometimes a spacer washer will stick to the end of the bushing. To avoid misplacing the washers it is best to keep them in place on the shaft during the cleaning operation.

Mark the position of the end shields with a sharp punch.

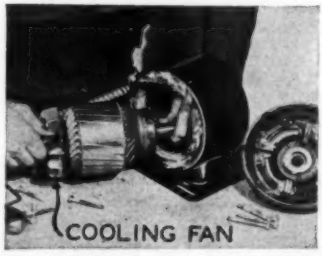
To Clean the Motor Parts

1. If the dirt inside of the motor is light and feathery brush it out with a dry paint brush or blow it out with air. If it is heavy oil-soaked dirt use a wood scraper to carefully remove the major portion. Do not damage the insulation on the windings. Any remaining dirty oil or gum should then be washed off with a mild solvent, such as kerosene, carbon tetrachloride, or Varnaline. Avoid the use of highly inflammable or corrosive solvents.

2. Wash the iron and bare copper parts of the motor, avoiding as much as possible soaking the coils with the solvent. If the bearings are packed with wool or waste, do not soak the packing with the solvent. Ball bearings should not be washed unless special ball bearing grease for repacking them is available. Be sure to clean all oil return holes leading from the ends of the bearing bushings to the oil reser-



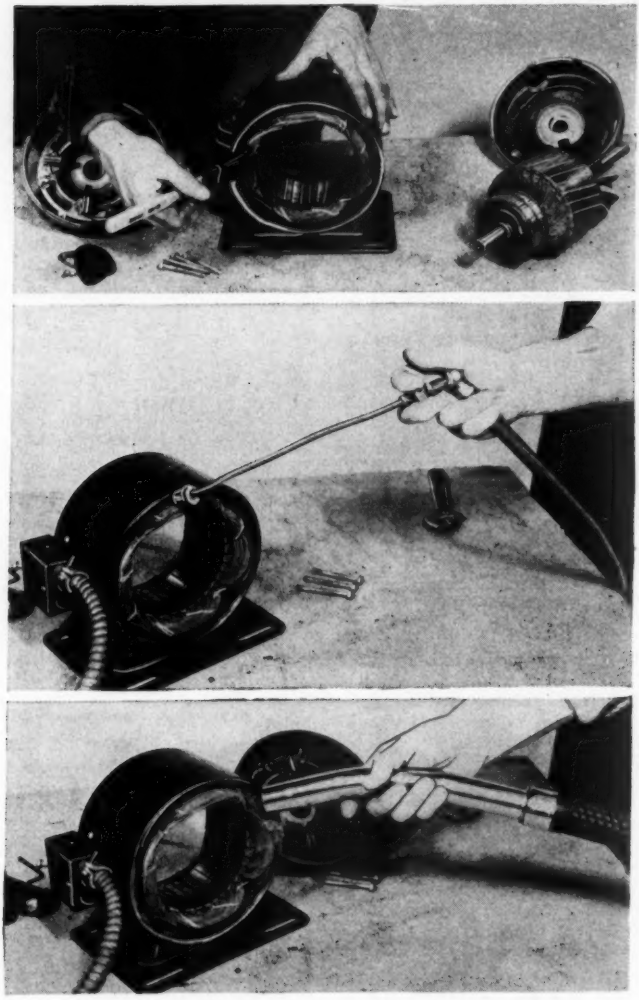
After removing the screws or bolts that hold the end shields to the frame, hold a screw driver against the edge of the shield and hit it a sharp tap with a hammer; pry loose gently and lift off.



In removing the rotor be careful not to break wires or scrape off any insulation. Note fan at one end of rotor and commutator at other. This motor has four brushes held in place by springs inside the end shield.

voirs. Flexible pipe cleaners or a small wire can be used for this purpose.

3. If the motor has brushes be sure that the brush guides are clean. Do not soak motor brushes in cleaning fluid. Wipe them clean with a cloth.



Methods of removing loose dirt. A dry paint brush is good, or one may use an air hose and blow out the dirt. Put a tapered rubber cork on the end of a copper tube to avoid injuring the insulation on the windings. A vacuum cleaner may also be used to blow out the dirt. A narrow fibre radiator tool would be better than this metal tube.

New Use for Fowls

With the speed of airplanes getting up around 400 miles per hour, the danger of pilot injury from the plane running into geese or other large birds becomes a possibility. Studies in windshield strength to prevent such hazards are being conducted in laboratories by shooting electrocuted chickens and turkeys out of large compressed air guns at speeds simulating the speed of air travel.

Homemade Speed Reducer

It is surprising how much of a load a small motor will pull if you let a fibre pulley rub against a partly inflated rubber tire. The tire may be anything from an old baby-buggy wheel to a wheel off the family car, but the use of friction pulleys offers a chance for a wide variety of speed and power. You can get change of direction by driving against the side instead of the face of the wheel and it often saves buying large size, expensive pulleys and belts.

Ed. Mitchell

Yale University Will Teach Agricultural Science

Yale University has recently announced a new program of instruction in Agricultural Science i nthe well known Sheffield Scientific School at Yale. It will not attempt to duplicate the training in practical agriculture given in agricultural colleges but will emphasize such sciences fundamental to agriculture as botany, zoology, chemistry, genetics, bacteriology and entomology. There will also be close cooperation with the Connecticut Agricultural Experiment Station and the schools of Forestry and Medicine.

Sulphur Prevents Yellowing

The Colorado State College Experiment Station has found that 5 to 20 pounds of sulphur on the soil around a tree with a straw mulch will prevent and in some cases cure chlorosis or yellowing of peach and sour cherry trees on some Colorado soils.

While a salesman was making his monthly rounds in the rural section of New Hampshire, a customer came in and bought a couple of flannel nightshirts of the store clerk. Afterwards a tall lanky backwoodsman said to the clerk.

"What was that stuff you sold that feller that just went out?"

"Nightshirts. Better get a couple while they last."

"Guess not, I don't go out much nights," said the lumberjack.

Heat—Enemy of Bacteria

By ED W. MITCHELL
From WGY "Farm Paper of the Air"

MR. DARWIN'S popular theory of "The Survival of the Fittest" has come to mean the survival of the Fightingest; and the dairymen who survive, and keep on eating, are those who can whip the bacteria that constantly threaten our milk supply.

There is no debate on the question of whether milk is the best, all-around food or not; because no one cares to take the negative side of the question, and it is hard to hold a debate with only one side of a question represented—but just as milk is the best food for man and beast, so also, is it the best food for bacteria. There's the rub.

Fresh, pure milk normally contains harmless and beneficial bacteria, and the lactic acid bacteria of sour milk do things for us that doctors proclaim lead to a long and happy life; but lots of undesirable bacteria get on the bandwagon as the milk proceeds on its way from cow to market, and these must be killed or kept down to a small number. They are the mortal enemy of pure milk; of health; and, what interests us right now, the successful operation of a dairy-farm. We got to kill 'em dead.

There are two practical ways to kill bacteria dead; with chemicals and with heat. Cleanliness will reduce their number; cold will retard their growth, but only strong washing chemicals and heat will put the finishing touch on them, and that is the job on hand today.

Most dairies, in fact all of them, are supplied with effective washing powders; and since directions for use are on each package, there is no need to discuss their use beyond the fact that warm or hot water is needed to get the greatest efficiency out of them. But, along with the chemicals to wash and rinse, we need hot water to wash and scald, and that is not so easy to get at the average barn or milk house. True enough, it may be carried from the house, where there is normally a supply on hand; or the utensils may be carried to the water supply at the house; or wood, coal or kerosene may be used to heat it at the barn. The objection to all of these obsolete methods is the amount of labor or fire risk involved; and in times like these, we must cut down on labor, and we must reduce the risk of fire.

Electric Heat Least Dangerous

The answer to this problem of getting hot water at the barn, if you have not guessed it already, is to use electricity to provide the heat. That form of energy involves the least amount of labor and risk of fire, and the manufacturers have devised appliances that make it low in cost. They have manufactured dairy water heaters all the way from little one gallon affairs that provide a jet of steam and a little hot water for a few utensils, to huge affairs that operate on "off-peak-load" or when all decent people except the dairy-men are supposed to be in bed and not using any electric power. There are combinations of washing vats with a cover to convert them into a sterilizer, too; high-speed heaters for small amounts and slow-speed heaters for big operations; a size and kind to fit almost any need.

At around a cent and a half a kwh, for the amount of hot water needed in the average dairy, I doubt if the cost for power to heat the necessary water in the milk house would run 10c a month per cow; and that is certainly cheaper than taking time to run back and forth to the house, or monkeying with a fire in a stove.

Right now, it is something of a nuisance to get the necessary priority orders through; and harder yet, to find just what you want in the dealer's stock on hand; but an electric water heater, scalding vat or sterilizer is so much the best way to keep milk utensils clean, that it is worth whatever effort it takes to get one.

To paraphrase Bob Adams:

"The farmer's work is never done,
He does two days' work in one.
And when he takes the homeward track
He meets himself, just coming back."

These days, the farmers are so rushed and short of help they almost pass by themselves rushing from one pressing task to the next. If you meet yourself in passing, stop and say hello and ask yourself whether an electric water heater wouldn't save you a lot of time and work.

Heat is the mortal enemy of bacteria, and electricity one of our best allies in fighting them.

"We've got to let him know we're not the enemy, You sing Yankee Doodle and I'll sing Dixie."

The percentage of rubber obtained from *guayule* increases with the age of the plant, from 4% at one year up to 17% to 22% when the plant is between five and seven years old.

WHAT HAPPENS TO AN EGG IN A WARM ROOM

With Some Suggestions for Keeping the Eggs Cool With Equipment You Have or Can Make at Home

THE accompanying photographs show, better than words can tell, what happens to many eggs produced on farms in the summer time. The spoilage of eggs by improper handling is enormous. This year, particularly, we cannot afford these losses.

How to Keep Eggs Fresh

Remove male birds from the flock as soon as the eggs are no longer being used for hatching. That is step one in producing good summer eggs.

Collect eggs twice a day or oftener and cool them immediately.

Hold eggs at a temperature as near 45° as possible until they are marketed. Eggs held at high temperatures will deteriorate rapidly. If held at much lower temperatures, they may "sweat" when taken from storage.

Market eggs as soon after they are laid as possible to insure the best quality.

Since refrigeration equipment is not readily obtainable now, and the materials for making it are needed for other war purposes, some brief suggestions for making the best use of what you have and for improvising homemade coolers are given below.

If you have an electric refrigerator the temperature on the lower shelves will be about 40° to 45°; in an ice refrigerator, probably 45° to 60°. Store the eggs in the refrigerator if you have only a few. If too many for storage there, then precool them in the refrigerator and store them in the coolest place you have on the farm—cellar, cave, empty cistern, heavily insulated storage room or box, or evaporative cooler. (See ELECTRICITY ON THE FARM, July 1941, p. 5.)

Can Use Milk Cooler

Should you have no household refrigerator or walk-in cooler but have space in your milk cooling tank, you can precool eggs in a milk can or a special container anchored in the tank. Do not wet them. If the natural seal is removed from an egg shell by wetting, the egg will evaporate and spoil quicker.

Another method some farmers have used is to place the egg baskets on boards or a rack just above the water in a milk cooler.

If you have no refrigerator of any kind, use the coolest storage place you have on the farm, but get the eggs there quickly. Or you might improvise a water cooler (ELECTRICITY ON THE FARM, Aug. 1939, p. 13) ice cooler (July 1940, p. 11) or an evaporative cooler.

The sketch on page 9 gives a suggestion for an evaporative cooler. The dimensions and details can be changed to suit your own requirements. In place of the evaporative excelsior-filled unit you can substitute an insulated compartment in which are placed blocks of ice; or a water cooled box may be made by substituting an old car or truck radiator through which a steady stream of cold water is kept flowing. A circulating fan is necessary in either case.

Evaporative coolers give the best results in dry climates. They have, however, been used successfully in eastern states where the relative humidity is sometimes fairly high. Water coolers would be satisfactory only where the water temperature is around 50° or lower. The water which flows through the radiator may be used for irrigating or stock watering.

Home Demonstration Club women of El Paso County, Colorado, plan to establish "merchandise marts" this year to facilitate the exchange of foods within the communities. This method of exchanging one type of surplus food produced on one farm for that of another kind produced on another will lead to a better system of cooperative living, it is believed.

Chart showing actual photographs, courtesy Swift & Co., Chicago.

Candled Appearance

(Drawn from actual experiments.)

Boiled Eggs

(Showing effects of evaporation.)

Cross Section Boiled Eggs

(Showing position of yolks.)

Poached Eggs

(Notice that only good eggs poach successfully.)

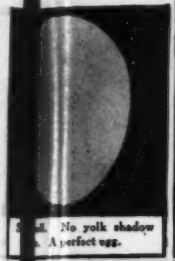
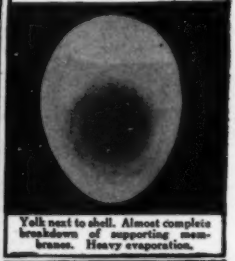
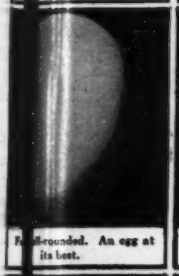
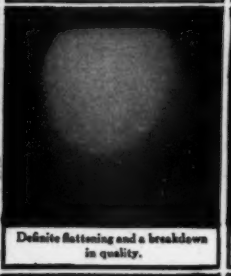
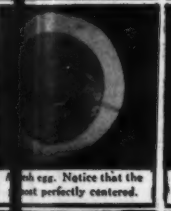
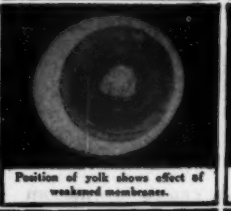
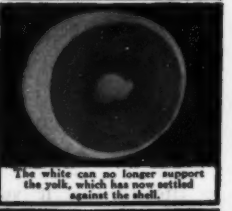
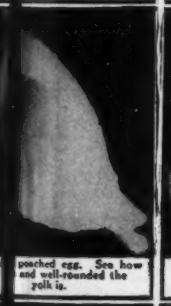
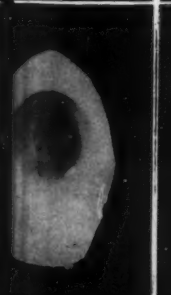
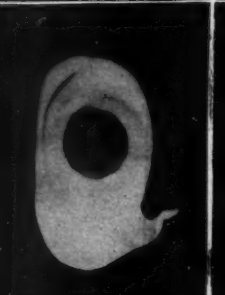
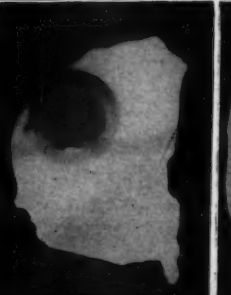
Fried Eggs

(Showing spreading out of whites.)

RESH
GGS

These eggs were kept in a
WARM ROOM (80° F.)

These eggs were kept
UNDER
REFRIGERATION

For 2 days	For 4 days	For 6 days	For 1 Week (45 to 50° F.)
			
...ll. No yolk shadow ... A perfect egg.	Still in good condition but with some evaporation.	Yolk becomes visible as high temperatures weaken the thick white.	Yolk next to shell. Almost complete breakdown of supporting membranes. Heavy evaporation.	Except for slight evaporation, this egg could scarcely be distinguished from a fresh egg.
			
...l-rounded. An egg at its best.	Slight flattening on top where evaporation has taken place.	Definite flattening and a breakdown in quality.	Six days in a warm room have made this egg thoroughly unsatisfactory.	Quality as well as flavor protected by refrigeration.
			
...sh egg. Notice that the ...ost perfectly centered.	Still a fine egg for any purpose.	Position of yolk shows effect of weakened membranes.	The white can no longer support the yolk, which has now settled against the shell.	Well centered. As fine an egg as Mrs. Housewife could ask for.
			
...poached egg. See how ...and well-rounded the yolk is.	Not quite as fine as No. 1 but still a delicious egg.	Things have taken a turn for the worse. Some of the white has started to pull away.	White is so weak that some of it has actually parted from the yolk!	Compact . . . uniform. An egg that is delicious, healthful, and easy to poach.
			
...ot-knit, solid, and slightly raised.	Still a good egg with no appreciable breakdown.	Indicates some weakness. White has started to spread out.	Weakened white has now spread over a wide area. Even the yolk is flat and watery.	No breakdown here! What a difference refrigeration has made!

Clarksville Farm Food Preservation Center

Georgia Community Starts with Small Cannery; Now Has Meat Cutting and Curing Plant, Cold Storage, Frozen Food Lockers and Small Community Dehydrator. Vocational Agriculture Teacher in Charge

By CAROLINE S. COLEMAN

DOWN in Clarkesville, Georgia, rural folks are not worrying about ration cards for food. They can live at home, and their winter diet will not be the exclusive hog-and-hominy fare popularly attributed to Southern hill people. Pantry shelves in Clarkesville homes are loaded with jars and packages of food; frozen farm products fill the community locker plant; and there is flour in the barrel—all because of electricity which stars in an all-out community co-operative plan.

Life in the Clarkesville neighborhood is reminiscent of the days of "log-rolling, corn-shuckings, cabin-raisings, and quiltings"—days when neighbors worked together with the assurance that many hands make light work. Clarkesville folks now work together as neighbors used to but electricity now makes the work light—and also does what human hands could not do.

Realizing that war must inevitably cut off some local food supplies the progressive farmers of Clarkesville went to work to grow their own food. It was less of a problem to grow foodstuffs than to prepare them for winter use, since all the equipment needed for this purpose is high-priced and one family could not afford to purchase all of it. Now, in co-operation with the State Department of Education, Clarkesville Center has been established with a canning plant, dehydrator, freezer-locker plant, and flour mill. The equipment is all the community needs for preparing food for home consumption.

Much of the credit for the Clarkesville Center belongs to Mr. L. E. Nichols, teacher of vocational agriculture in the Clarkesville schools. He has looked upon his job as an opportunity for community service as well as teaching. He started with a community cannery at the school and has gradually added the other services.

All summer long the Clarkesville Center is as busy as a bee hive. Farmers drive up in trucks loaded with fruits or vegetables. The whole family comes along. The men help the women and girls prepare the foodstuffs for canning or drying, while the little folks play about under the trees, and the whole thing is like a neighborhood picnic.

Canning fruit and vegetables at home is hard work for the housewife, but at the Center where electrical equipment is available it is fun to "turn off" several baskets of peaches or a bushel or two of tomatoes, and compare one's canned products with the results achieved by neighbors working at the same time.

Fruits and Vegetables Dehydrated

The dehydrator, homemade at a cost of about $500, is a vault-like structure with several doors through which "trucks" with tiers of trays holding fruits or vegetables are moved. The hot air is turned on, the temperature regulated according to the type of foodstuffs, and the process kept up until drying is completed. The dried foods are stored in waterproof containers and packed away on pantry shelves to be enjoyed as a welcome change on the menu when the family tires of canned foods. Figs, apples, peaches, potatoes, cabbage and onions are

Above: L. E. Nichols, teacher of vocational agriculture and "spark plug" of the Clarksville Community Center, shows what happens to a bushel of peaches after they are dehydrated.

Right: One of the four dehydrators operated in conjunction with vocational-agriculture departments in Georgia schools. F. B. Tatum, farmer and operator is placing a truck of loaded trays in the drier.

Some of the lockers in the freezing room at Clarksville. Mrs. L. L. Stuart is getting a steak, and some frozen peas and strawberries from her locker.

some of the products processed in the Clarkesville plant.

The freezer locker plant which resembles a concrete cellar, is constructed to meet the farmers' needs. Due to sudden changes in temperature hog-killing is largely a matter of "luck" in the South. Comes a freezing day and the farmer kills his fine hogs, but possibly a warm night follows, and "keeping" the meat is a problem. Now, thanks to electricity all the farmers of Clarkesville are quite independent of the weather man. The farmer butchers his hogs when it is convenient, and in a few hours has the meat chilled and safely stored in the freezer locker plant at the Center. One side of the plant is constructed for meat chilling, aging and curing. Here the temperature is kept at 38 degrees. Beef is held here for tenderizing; hams, shoulders and choice cuts of pork are hung in the curing compartment. On the other side where the temperature is kept below zero, the family lockers hold spare ribs, sausage, and other cuts of fresh meat as well as fruits and vegetables to be eaten any time of the year.

"Electricity helps us to save money by better management of our poultry flocks," Clarkesville people declare. The old hens which quit laying in the summer and vacation in the flower beds are dressed and stored in the freezer locker. They are delicious in the winter, when the layers are needed to fill the egg basket with top-priced eggs.

Grist Mill Reduces Food Costs

The flour and grist mill at the Center is electrically operated. It turns the farmers' grain into the wherewithal for Southern hot biscuits, cornbread, and grits. This Southern staple, grits, retails at about ten cents a quart, or over $3.00 a bushel, while the farmer grows corn at less than $1.50 per bushel. Grinding grits as well as flour at the Center is a big saving for Clarkesville people. It is quite easy when coming to the Center with food products to be canned, dehydrated or frozen, to bring along a few bags of grain for grinding.

The Clarkesville Center serves families within a radius of ten or twelve miles, with the exception of meat-curing facilities which may be utilized by farmers in three counties which have no equipment of this type.

"This is the kind of thing we are working toward in Georgia," said members of the State Department of Education. Clarksville was the first but is only one of the Community Centers operating in the State. "We believe that the community can operate as a unit and that by having our vocational facilities grouped we can better serve the individuals of that community."

Frozen honey-dew melon put up in a honey and water solution is one of the most popular of the frozen foods with the people of La Plata County, Colorado.

Agricultural tests have shown that *potatoes* planted across the slope on the contour yield 5% to 15% more than those planted up and down hill.

Coffee substitutes and coffee blends may contain chicory, soybeans, roasted barley, Mexican chick peas, roasted rye cereal, rolled wheat flour, molasses or corn meal.

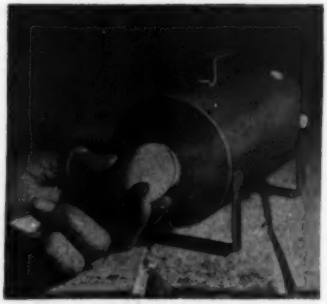
Safety hint. Guard yourself against accident by guarding the machine. Cover open gears and sprockets with shields of metal or wood. Keep clothing and hands from chains or moving parts. Stop the machine to oil or adjust it. You'll last longer.

—W. C. Krueger.

A lady while walking through a country village, heard the Saturday evening choir practicing in the village church. At the same time a naturalist was standing near by listening to the sound of a cricket.

"Lovely singing," said the lady.

"Yes," said the naturalist. "They do it by rubbing their legs together."



Good Egg? Bad Egg? This is another view of the egg candler shown on the front cover. It is not a "boost" for any particular type of egg candler—just a reminder to keep on watch. Eggs can spoil quickly during warm weather.

Electrical Housekeeping

Edited by **GAIL MEREDITH**

Saving With Cold

RATIONING underlines cold as a weapon for fighting a delaying action against food losses. With butter at eight points a pound, this is no summer to let it stand around on a plate till it melts to a yellow pool of oil. Nor is this the time to let little dabs of cream go sour in the bottom of pitchers, standing forgotten on a table in the kitchen.

To keep dairy products sweet, hold them in the refrigerator from the time they come into the house until they go onto the table.

Keep Meat in Frozen Condition

If you bring meat from your locker in town, it needs to be kept frozen in your refrigerator until you are ready to use it. That means keeping it in the frozen storage compartment, or lacking that, in the freezing unit itself.

The meat that costs you red stamps for every pound needs constant cold, too. Unwrap it as soon as it reaches your kitchen, and wipe it off with a cloth or scrape it carefully. Do not wash it. Put it at once into the meat compartment of your refrigerator, or on a clean, dry, shallow dish. Cover it loosely with waxed paper and put it in the coldest place in the refrigerator.

Chopped meat, and it looks as though we'll all be using more chopped meat than ever this year —chopped meat spoils more quickly than meat all of a piece. Because you cannot be certain of the care it has had before you bought it, it is one of those things it is wise to eat soon after you buy it. Store it in your frozen food compartment for extra safety.

The meat sundries whose ration points are low and nutrition high, spoil quickly. If you can use them, the kidneys, heart, sweetbreads, or brains, soon after butchering or the day you bring them home from town, that's fine. But gasoline rationing and the time both have something to say about the frequency of your shopping. Often it is convenient and cheaper to buy meat, as you do other supplies, for a week at a time.

Some people who buy ahead insure the meat's keeping by freezing it, chops, steaks, or ground meat, as well as the more perishable organs,—freezing it solid right in the ice cube trays of their refrigerators. This is a temporary expedient, not in any way a substitute for locker storage with its quick freezing and its ample capacity.

If you have a mind to try it, you'll find the method simplicity itself. Just put the meat in a tray lined with waxed paper long enough to reach over the top of the meat. Put the tray on the coldest shelf of the freezing chamber, usually the lowest. You might even put a little cold water on the shelf under the tray, as you do when you want to hurry the freezing of some dessert. Then turn the control to fast freezing.

As soon as the meat is frozen solid, turn the control back to the normal running temperature.

Most meat is frozen raw. Just wipe it off, trim it of any extra fat, and lay it flat in the tray. Beef hearts, larger than others, better be cut in half or sliced before they are frozen. Sweetbreads, however, are better precooked. Start them off as you would in preparing them for the table by soaking them in cold water for half an hour, then cooking them slowly, just under a boil for about twenty minutes. Drain the water off, cover them with cold water, and let them stand till cool. Then skin them and lay them in the tray for freezing.

Vegetable Refrigeration

Fresh vegetables need refrigeration, too. Cold, and the right humidity prevent vitamin losses in them. Research into the results of careless handling of vegetables is fairly new, but where it has been carried on, the results show that proper refrigeration effects big savings.

Tests have been made on lettuce and spinach for losses of Vitamin

C. Most every gardener raises lettuce, a long-row maturing week after week for summer meals. These tests show that if you pick a pan of lettuce and leave it standing in your kitchen at ordinary room temperature for just one day, it may lose as much as 40% of its Vitamin C. Spinach the same way. Picked and left on your work table for twenty-four hours, it loses this temperamental vitamin with never a way of getting it back again.

Retain Goodness of Vegetables

There seem to be two ways of making sure that you're giving your family their vegetables with all the goodness in them. One is to pick them just before you start cooking; the other is to store these perishable foods in your refrigerator. If you want to get the vegetables picked and washed and ready in the morning for the day's meals, you can still do it. Stored in the damp cold the covered vegetable pan provides, the vitamin losses will be very slight. The research men say negligible, which, I take it, means hardly enough to count.

Washing New Fabrics

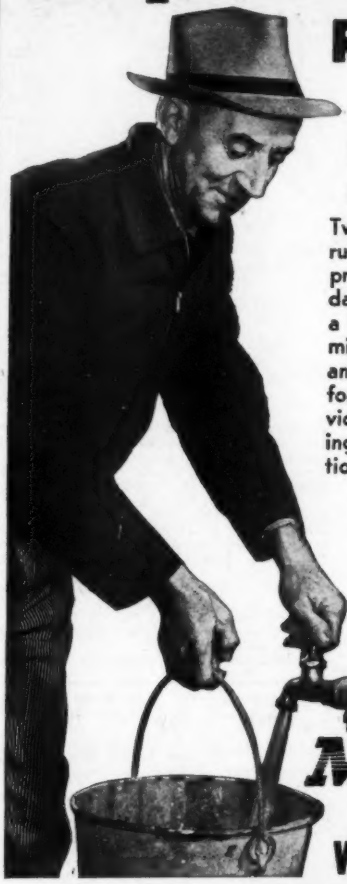
Many of the new materials coming into the market while cotton, linen, and silk go off to war, are made of fibres that offer new laundering problems. Few of them can be tossed in with the rest of the family wash.

I know that sounds like a nuisance, but it will pay to wash them separately.

There is one thing that all of these new fabrics have in common. They are all the better for a speedy washing. That means getting all your equipment and materials ready before you start, just as you get out your utensils and ingredients before you begin mixing a cake. Use soft water at just the right temperature, warm, not hot, and a neutral soap.

If the labels say the colors are fast, you can soak the garments for five or ten minutes, then put them into a good suds with just enough water to float the material.

Keep the WATER RUNNING!



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Two great allies — electricity and running water—are speeding food production for the war. An abundant supply of running water with a Myers water system means more milk, meat, eggs and vegetables—and more time and labor available for other farm work. It also provides many advantages for cooking, canning, sprinkling, fire protection, etc.

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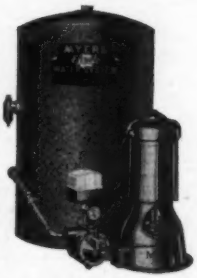
Tells how to make *minor* adjustments and repairs on *any* make of pumping equipment. Remember, most dealers are now short-handed because of the war. By helping avoid needless service calls, you help save time, tires and needed manpower, and your dealer will appreciate it. *But*—when a service call *is* necessary, get the capable service of an experienced pump man. You can depend on your Myers dealer for repair parts as well as expert servicing on any make of pumping equipment. Mail coupon for free book and dealer's name.



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Price of each pattern 16c (in coins). Send orders to ELECTRICITY ON THE FARM, Pattern Dept., 243 W. 17th Street, New York, N. Y. Allow plenty of time. Mail is slow these days.

Wash by squeezing the soapy water through them again and again. Don't rub; remember, just squeeze gently. Rinse first in warm water. The last two rinses —there should be three—can be cool for most of these fabrics.

With colored rayons, wash the garment quickly and use very cold water for the rinses to keep the colors from running. And by cold, laundry specialists mean as cold as the water will run, and for the last two rinses, really ice cold if you have ice you can use.

Don't Put Through Wringer

Press the water out of the fabric with your hands and roll the garment in a heavy bath towel to take up as much of the moisture as possible. If you run these new rayons through the wringer you may make creases that are very hard to iron out. Slips and dresses can be dried, as I said, by pressing the water out of them, and then hanging them from a covered hanger until they are nearly dry. Rayon dries slowly. Some garments should be hung in the shade or in the house.

Handle Wet Rayon Carefully

If you are going to hang rayons on the clothes line outdoors, lay them over the line, don't pin them up as you do the rest of the wash because clothes pins may cut holes in the wet rayon. Always handle wet rayon carefully for the fibres are weak when wet. Be sure that stockings or unironed underwear are thoroughly dry before you put them on.

Some fabrics need not be hung up at all, but can be ironed, still damp, as you take them from the towel. Sharkskin is like that. After you wash a suit or dress of this, roll it loosely in a heavy towel, and put it in the refrigerator long enough to chill it thoroughly. Then iron it, still damp, on the wrong side, using a warm iron.

Not only sharkskin, but most rayon dresses or slips should be ironed on the wrong side while the material is still a little damp. With a satin slip, this preserves the lustre, too. Spun rayons should be steam pressed when they are nearly dry. Iron them on the right side over a wool press cloth. Some rayons that shrink in the washing can be stretched back to their original measurements when you iron them.

How will you know just which treatment to give these new mixtures? Read the label on a ready made garment to see if it can be washed and whether the color is fast, or needs special quick laundering. Ask the clerk who sells you materials how they should be washed.

Nebraska farmers who do errands for each other in town to save tires use signal flags on their windmills to tell other farmers to stop, if passing.

★ ***Buy War Bonds*** ★

Honey Homily

If your sugar has a way of dwindling down to the last few grains before your next ration stamp is good, this may be the time to try honey for more than an occasional treat.

Of course it is best just as it is with the natural color and flavor unchanged by heat. It is a good companion for biscuits and waffles and griddle cakes. If you'll warm liquid honey just a very little, you can drizzle it over a dish of hot cereal or around a pancake like syrup. Drizzled honey goes well on ice cream too.

You can use it to sweeten hot drinks or cold drinks, measuring it out to taste. If you are trying to coax a little more food into some members of your family, try adding two tablespoons of honey to a glass of warm milk. Lemonade is good with honey. Two tablespoons of honey, the juice of half a lemon, and one cup of water are the proportions the American Honey Institute recommends.

Honey can be used instead of sugar in many different kinds of cooking. When you are making fruit sauces, fresh or dried, cook the fruit first without sweetening. When it is done, and taken from the fire, add the honey. The amount will be bound to differ with individual tastes, but it may help to know that the Institute recommends two to three tablespoons of warm honey for each cup of thick apple sauce. For a cup of prunes, they say, one tablespoon of honey is usually enough.

When you bake with honey, you can use it for quick breads, cakes, and cookies. You can use it for puddings and candies, too—you need to modify your recipes to fit its special characteristics. The general rule in substituting honey for sugar is to reduce the liquid in the recipe one-fourth cup for each cup of honey used, and to use a scant measure of flour. But in chocolate cakes, or fruit cakes, the cake that is made with honey will need as much liquid as the one that is made with sugar.

When you are mixing cakes or quick breads, mix the honey with

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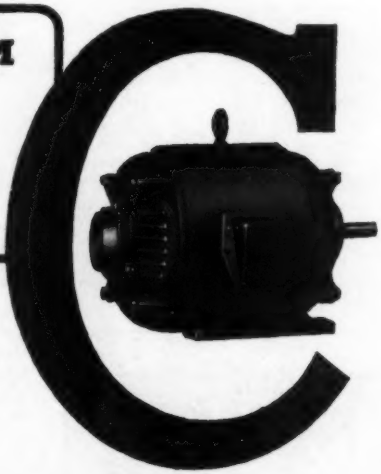

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the liquid. For the baking, the oven temperature should be low. High temperatures change the flavor of the honey because the oils evaporate and the sugars in the honey are easily carmelized.

If you are not much of an experimenter, you may like to use recipes that have been developed by food experts especially for honey. These cookies and the nutbread are suggested by Elizabeth Whiteman and Fanny Walker Yeatman, Bureau of Home Economics in a publication HONEY AND SOME OF ITS USES, Leaflet No. 113, USDA.

Cookies

¼ cup butter — 1 egg, beaten
¾ cup honey — 2 tbsp. milk
2 cups sifted flour
2 tsp. baking powder
½ tsp. salt
1 cup chopped nuts
½ cup chopped dates, figs or other dried fruits
½ cup chopped candied citron or pineapple

Cream the butter. Mix the beaten egg, honey and milk. Add the nuts and fruits to the sifted dry ingredients and add alternately with the liquid to the butter. Drop small spoonfuls on a greased baking sheet and bake in a moderately hot oven, 375 degrees F for about 10 minutes.

Nut Bread

2 cups flour — ½ cup honey
½ tsp. salt — ½ cup milk
1 egg, beaten
½ cup coarsely chopped nuts
3 tsps. baking powder
2 tbsp. melted butter

Add the nuts to the sifted dry ingredients. Combine the beaten egg, honey, milk, and melted butter, and add to the first mixture. Stir until the ingredients are just moistened. Bake in a greased bread pan in a moderate oven, 350 degrees F for 45 to 50 minutes.

The American Honey Institute gives these recipes for two cakes and a boiled frosting to top off either one.

Super Delicious Chocolate Cake

2/3 cup honey — 1 tsp. vanilla
1 tsp. soda — 2 eggs, unbeaten
¾ tsp. salt — 2/3 cup water
½ cup sugar
3 squares chocolate, melted
1¾ cups sifted flour
½ cup shortening

Blend chocolate and honey; cool to lukewarm. Sift flour once, measure, add soda and salt, and sift together three times. Cream butter thoroughly, add sugar gradually, and cream together until light and fluffy. Add chocolate-honey mixture and vanilla. Blend. Add eggs one at a time, beating thoroughly after each addition. Add flour, alternately with water, a small amount at a time, beating after each addition until smooth. Bake in two greased 8 inch layer pans in 350 degrees F oven 30 to 35 minutes.

Orange Honey Cake

¾ tsp. salt — 2/3 cup honey
½ cup sugar — 2 egg yolks
2 cups sifted cake flour
3½ tsp. baking powder
½ cup shortening
½ cup orange juice
2 egg whites, stiffly beaten

Sift flour once, measure and add baking powder and salt, and sift together three times. Cream butter together until light and fluffy. Add thoroughly, add sugar gradually and cream together until light and fluffy. Add honey. Blend. Add egg yolks and beat thoroughly. Add flour, alternately with orange juice, a small amount at a time, beating after each addition until smooth. Fold in egg whites. Bake in two greased 9-inch pans in moderate oven, 350 degrees F., 30 to 35 minutes.

Boiled Honey Frosting

1½ cups honey — 1 egg white
⅛ tsp. salt — ½ tsp. vanilla
Cook honey and salt to 238 degrees, F. or until it makes a soft ball when dropped into cold water. Beat egg white. Pour the syrup in a thin stream over the beaten egg while continuing to beat until all syrup is added and frosting will stand up in peaks. Add vanilla and spread on cake.

One nice thing about honey is that you can store it almost indefinitely. Liquid honey will keep well in a warm dry place, or at temperature below 55. Freezing does not hurt the color or the flavor, but it may hasten granulation. Comb honey should not be kept in the refrigerator; store it at room temperature. Honey absorbs and retains moisture so damp places are bad for storage. Most honeys will crystallize if they are kept a long time, but you can dissolve the crystals and turn the honey back to liquid if you'll warm it gently in water that doesn't get hotter than 140 degrees.

Electric Ranges

To make them give you the best service use the surface units in rotation. Don't turn on the left hand front unit every time. Plan your cooking. Except with frozen

foods, take food from the refrigerator and let it come to room temperature before putting it on to cook. Use the heat that fits the job, and the utensil that fits the unit. Use the least possible amount of water when cooking vegetables. If the heat is turned low as soon as the water steams, and the food is cooked no longer than necessary, it will not burn. Use your oven to prepare full meals. Get the right temperature, then time the cooking by the clock. Don't keep opening the oven door.

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Mechanical Cow Milked with a Push Button

By MARY MARGARET LYNCH

ONE of the most ingenious devices ever to be welcomed by a ship's crew, or a group of American men stationed far from civilization, is the "mechanical cow". This "cow" which may be placed in operation merely by connecting it with the nearest electrical and water outlets, will produce milk for drinking, or coffee, or whipping cream, or an ice-cream mix—all at the flip of a switch. Technically, the mechanical cow is a machine which mixes milk powder, water and sweet, unsalted butter in stated proportions. The machine pasteurizes the mixture, which then enters an emulsifier. The emulsifier rotates at high speed, and creates a pressure on the particles of the mixture so great that the butter fat will not later separate from the milk. The milk is cooled over a surface cooler as it leaves the emulsifier. The "cow" is commercially available in capacities of 40, 80, and 160 quarts-per-hour. The three 160-quarts-per-hour "cows" installed at the U.S. Naval Operating Base on Guantanamo Bay, Cuba, provide 3,000 quarts of milk and 1,000 quarts of ice-cream mix every day, seven days a week. This is claimed to be equal to the production of a herd of 250 cows.

A self-contained Mechanical Cow of 40 quarts per hour capacity. It uses sweet butter, powdered skim milk and water to turn out a pasteurized, and cooled whole milk, thin cream, thick cream or ice-cream mix. It is all electrical and requires only the proper proportioning of ingredients.

The amazing "cow" has been installed in Naval Air Bases in Alaska, Newfoundland, Bermuda, Jamaica, Trinidad, and island bases in the Pacific. Other "cows" have gone so far from home as Moscow, Russia and Johannesburg, South Africa. The mechanism is in use on submarine tenders and on more than 150 ships of the U.S. Navy. The sailors who know the cow, affectionately call her "Betsy". Before the war, "Betsy" was featured on the ships of twenty steamship and freighter lines. It is reasonable to assume that many of these ships are now serving as troop transports, or filling some other war need, so that the "cow" on board will have continued work making milk and cream and ice-cream mix for Allied service men on the seas.

Of course, bossy, down on the farm, still has to furnish the ingredients for the mechanical cow.

Delta, Colo.—Lamb losses have been reduced by 5 to 10 per cent through electric floodlighting in the lambing houses, reports D. C. Mitchell, manager of the Delta-Montrose (Colorado) Rural Power Lines Association. One farmer says that the lambs saved in one season paid the entire electric bill on his farm for the year. The use of electric sheep clippers at shearing time has enabled fewer men to do this annual job on the ranches.

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DE LAVAL is doing its best to speed the war effort. More milk, cream and other dairy products—our most essential foods—are being produced in less time, with less labor on thousands of farms, with De Laval Milkers and Separators . . . De Laval factories are doing important precision war work as well as making as many standard De Laval products as our Government desires us to do . . . De Laval Dealers everywhere are servicing and reconditioning users' machines . . . Fortunately De Laval Milkers and Separators are quality-made for long service—they are the world's best—easy to adjust and recondition . . . If you do not know the name of your dealer, write nearest office below

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By JEROME J. HENRY

Van Buren, Arkansas, Is Victim of "Duration"

The war may undo what Bob Burns did for his little old home town of Van Buren, Arkansas.

When bazooka-playing Bob rose to fame in radio and motion pictures, part of his success was due to the stories he told of his kinfolk and home town.

Tourists poured in by the thousands to see the sign reading "Van Buren, pop., 6,000. Home of Bob Burns." Van Buren's stores did a land office business in films, cameras, souvenirs, picture postcards and copies of the local gazette. Doc Barr, the druggist frequently referred to by Bob, had to open a new fountain to keep pace with the tourist demand for root beer floats, which Burns often praises on the air.

Two tourist camps opened at the edge of town and did a flourishing business.

But now them days may be gone for the duration. The tourists can't get tires and gasoline for the pilgrimage to Van Buren.

"Virginia" Doesn't Mean a Thing

Virginia is her first name but millions wouldn't know you were talking about one of America's most popular songstresses unless you said "Ginny." But when you say "Ginny," every one knows you mean Ginny Simms.

Ginny was a student in Fresno Teachers College in Calif. when she decided to seek her musical fortune. Her voice has had little cultivation. Although she takes an occasional lesson, her delivery is untutored and quite personal. Her favorite tune, incidentally, is "St. Louis Blues."

Ginny's personal type of delivery has made her a great favorite with servicemen. What spare time she finds from her work she spends entertaining servicemen on leave in Hollywood.

Her second major pursuit is closely connected with this plan for Ginny, who has entertained so many of the boys with her singing, knows what their first great love is. And so she produces food on her farm nearby Hollywood. She raises alfalfa and citrus fruits, has more than a thousand chickens and 19 cows.

Here and There Among Radio People

Ed Jerome, regular on "Cavalcade of America," has made and lost two fortunes—one in Texas oil, one in Florida real estate. But he's doing all right now, too. He's heard on nine radio shows. . . .

This is Ada Beth Peaker, Carnation Contented chorister, who made her vocal debut at the age of four, singing in a church in Newton, Iowa, her home town. She has a degree of Bachelor of Music from Drake University.

Garry Moore says the trouble with New York motorists is that if you give them an inch, they'll take a fender. . . .

Bob Hope says that with the gas and rubber shortage, motorists should never drive faster than 200 billboards an hour on the open highway. . . .

George F. Putnam, NBC commentator and master of ceremonies for "The Army Hour" startles New Yorkers with his trick horsemanship in Central Park. George comes by such talent naturally. He is a descendant of General Israel Putnam, who made history in 1778 when he escaped from the British on horseback. George financed his way through the University of Minnesota by working summers on a Montana ranch.

New Publications

(Publications are obtainable from the addresses given in the description. Some states make small charges for bulletins sent outside the state.)

• CENTURY MOTOR CARE AND ADJUSTMENT. The Century Electric Co., St. Louis, Mo., has a series of bulletins showing cut-away views of Century motor construction and giving instructions for care, trouble-shooting, oiling and adjustment to prolong the life of motors. One 4-page folder for each type of motor. They are technical but explicit and instructive. Specify the type motor given on the nameplate if you write for copies.

• ELECTRICITY STEPS UP BEEF OUTPUT. Four-page folder telling how electricity may be used to advantage in the production of beef. Ask for B-3101-1, Westinghouse Elec. & Mfg. Co., Pittsburgh, Pa.

• FUNDAMENTALS OF ELECTRICITY. 66 pages, illus. 15c. Address: School Service, Westinghouse Elec. & Mfg. Co., 306 Fourth Ave., Pittsburgh, Pa. This is NOT a book on rural electrification. It covers the basic facts of magnetism, electricity, batteries, currents, circuits, instruments, heat, force, motors, transformers, the telephone. It is written as a text for schools and study groups and is based on an outline by the War Department for use in Pre-induction Training Courses. An excellent book for study, profusely illustrated and simply explained.

• OPERATION, ADJUSTMENT AND REPAIR OF ENSILAGE CUTTERS. Papec Machine Co., Shortsville, N. Y. A general instruction book. Also a similar book is available on HAMMER MILLS.

• MILKER SERVICE CHARTS. DeLaval Separator Co., 165 Broadway, New York City. A chart of instructions for maintaining maximum milker efficiency.

Yellowstone National Park is cutting its herd of *elk* by 6,500 as it now has more than the safe carrying capacity of the Park.

—I'm proud I am a farmer!—

Questions and Answers

Fertilizer for Fish

► **Question:** *Where can I get fertilizer for fish?* S. L., Kans.

► **Answer:** Fertilizer for fish ponds is the same fertilizer you use for a garden. The fertilizer makes the vegetation at the edge of the pond grow faster and the fish feed on water life that eats the vegetation.

Use Incubator for Brooder?

► **Question:** *Could a 350 egg size hot water incubator be made into a brooder for starting chicks?* Mrs. H. C. H., Ill.

► **Answer:** I would not recommend trying to convert an incubator into a brooder for starting baby chicks. You will need better ventilation than you will get in an incubator.

Motor Size for Homemade Garden Cultivator

► **Question:** *Would you tell me if putting a ¾ hp electric motor on a hand cultivator would be practical? The cord would have to be about seventy-five feet long. The wheel on the cultivator is twenty-four inches in diameter and the rpm of the motor is* 1725. *Would you tell me what size pulleys I would have to use?* A. J., Ia.

► **Answer:** It is difficult to say how much power your hand cultivator would require. It will depend on the kind of tools you use, the width of cultivation, type of soil, etc. You would probably also need cleats on the wheels to get traction. My guess is, that you would need at least a ¾ hp motor to do a satisfactory job of cultivating.

In order to get a cultivating speed of 2 miles per hour with a 1725 rpm motor, you would need a double gear reduction. If you could get a worm gear speed reducer similar to those used on washing machines, that reduction should be twelve to one and your motor pulley would then be 2½" and the driven pulley on the cultivator wheel 14".

Baled Hay Elevator

► **Question:** *How can I build an electrically operated elevator to put baled hay in the loft?* H. R., Mo.

► **Answer:** The best advice I can give you right now on the building of an electric elevator for putting baled hay in the loft, is to get plan #B-212 from the University of California, Department of Agricultural Engineering, Davis, California. This was described on page 4 of our February issue. While this is a small elevator intended for grain, you can follow the same general plan, making the elevator wide enough to take a bale of hay. It could also be used for elevating ear corn and for small grain if the flights are made to fit close to the bottom of the elevator chute. An elevator very similar to this is in use by the Dairy Department of the University of Tennessee for elevating baled hay, straw, and ear corn. As I recall, it was operated by a 1 hp motor. The size motor you need will depend upon the speed at which you wish to hoist.

Radio Interference

► **Question:** *I have a fluorescent light in my kitchen (No. 2052 Mitchell Adapter Unit) operates only on alternating current* 110-125 *volts. When the light is on it interferes with the radio so much, one of them has to be taken off. What's wrong?* E. P., Mich.

► **Answer:** Try the following ways to cure the trouble:

1. Move the radio as far away from the lighting fixture as possible in the room where it is used. If the aerial is built into the set then the thing to do is to separate the set and the fluorescent fixture by a distance of at least 9 ft.

2. Move the radio from place to place around the room to find a spot where it will give the least interference.

3. Plug the radio into a circuit other than the one which leads to the fluorescent light.

4. Use an outside aerial.

It may be that if you take these steps one by one you will gradually

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reduce the interference to a point where it will not be serious. However, if after you have done all of these, you still have radio interference then I would suggest that you install a radio interference unit in the fixture. These are small devices made for the purpose by radio manufacturers and are designed to be connected across the feed lines to the fluorescent lights.

Safe Outflow from Septic Tank

▶ **Question:** *Please send me information about the best way for outlet for cement septic tank. My well is on the east side of the house and septic tank on the west side; how far out should the outlet go to be safe?* L. L. M., Kans.

▶ **Answer** I would carry the effluent from my septic tank to a point, at least, 100 feet away from the well in tight sewer tile before distributing it in open jointed drain tile. The depth and distance apart of the tile in your distribution system will vary with the type of soil. I would suggest that you write to the Department of Agriculture, Washington, D. C., and ask for their bulletins on septic tanks.

Spotlight for Protection

▶ **Question:** *We would like information about a spotlight. Either where to buy or how to construct. We want it mounted on the house to throw a beam about* 1,000 *feet to brooder houses that distance away.* A. R. N., Ia.

▶ **Answer:** The General Electric Company and other companies have made spotlights selling for under $10 which would answer your requirements. They are difficult to obtain now in war-time.

The Portable Light Company, 25 Warren Street, New York City, makes Marine Searchlights which would give you just what you want but you would need an AA-4 priority or better to buy one.

A good automobile spotlight which might be purchased from an auto supply company or from an auto wrecking concern would give you a pretty good beam. It would be necessary to purchase a transformer of 50 watt capacity or larger to step down the voltage from 115 v. to 6 v. in order to use one of these lights on the power circuit. Little transformers used for operating toy trains would be satisfactory.

CLASSIFIED ADVERTISING

ELECTRICITY WITH THE LYON LINE can increase your production. Several Lyon Electrical Supplies can be shipped reasonably soon. Repairs and certain parts for homemade brooders and dehydrators are receiving special attention. A card will bring you information on your specified requirements. LYON RURAL ELECTRIC COMPANY, Dept. E. F., Greensboro, North Carolina, or San Diego, California.

A. C. Current for Engine Ignition

▶ **Question:** *I have a* 4*-hp gasoline engine in my farm shop that uses a 6-volt Hot-shot battery and I want to take current from my* 110*-volt lighting circuit to spark the coil in place of the battery. Coil is same type as used on Model T Ford. Can it be done by using light bulbs as a resistance?* F. B. R., Kan.

▶ **Answer:** Such a hook-up might work but we cannot recommend it because of the hazard involved. There is always danger from short circuits, variable voltage and meddling by someone who does not understand the hazard involved. The momentary surge of 110 volts may also burn out your coil. While we do not advocate using 110-volt current at all for ignition, the transformer would be safer than lamp resistance. A door-bell transformer is not adequate. You will need 8 to 12 amps while the bell transformer produces only about 1 amp. A transformer from an electric train might do. A much better method would be to use a storage battery. They are now available. You can make your own battery charger from an old car generator.

Elevator Gearing

▶ **Question:** *I am building a farm elevator for corn and grain. It will be* 20 *feet long by* 8 *in. wide. It will be run by a single chain carrier. The slats will be spaced* 8 *in. apart. The lower sprocket is* 8 *points and the upper* 6 *points. I want to put a ½ hp motor at the bottom. What I would like to know is how I can hook it up to give satisfactory results. Would I have to back gear or not? I want the elevator to run about* 175 *revolutions a minute.* F. G., Ohio

▶ **Answer:** *If you can obtain a* 20 in. V pulley for use on the drive shaft of your elevator and a 2 in. pulley for use on the motor, you will not need any back gearing. That would give you about 175 rpm. If you cannot get pulleys of exactly that size, the driven pulley should be ten times the diameter of the motor pulley. I would recommend against using anything smaller than a 2 in. pulley on a ½ hp motor. The usual speed of farm electric motors is 1740 rpm.

Spinach Washer and Carrot Dicer

▶ **Question:** *Please give me information if you possibly can on an electric machine to wash and dry the vegetable spinach, also a machine to dice carrots for soup.* J. P., New York.

▶ **Answer:** The Chisholm Ryder Co., Inc., 4121 Highland Avenue, Niagara Falls, N. Y., manufacture a spinach washer. They also manufacture slicing machines and may take care of your carrot slicing problem.

The only company I know of that makes carrot dicers is the Handy Manufacturing Company, 2432 W. Lawrence Street, Chicago, Ill. I am not sure whether this is a home or commercial size outfit.

Oven Canned Beans Spoiled

▶ **Question:** *We canned raspberries last year according to instruction in our electric range book. They were perfect. The snap beans spoiled within a short time. Why?* S. B., Ill.

▶ **Answer:** Oven canning, the hot water bath and the open kettle method give good results with acid fruits and vegetables. The U. S. Department of Agriculture recommends against these methods for some foods, particularly the non-acid vegetables such as beans, peas, corn, etc. The reason is this. These vegetables may contain spoilage organisms and soil-borne botulinus which may cause poisoning unless the canning temperature is raised above 212°. In any of the methods above, the maximum temperature reached is that of boiling water, 212°. In a pressure cooker at 15 pounds pressure the temperature reaches about 250°, which is sufficient to destroy these bacteria and spores.

Freezer from Water Cooler

▶ **Question:** *I have a motor, two-cylinder compressor from a drinking water cooler and an automatic switch. Could I use them in making a farm freezer?* J. A: A., Pa.

▶ **Answer:** Unless your compressor is from a very large water cooler it would not be adequate for a freezing cabinet.

You can get plans for making homemade freezing cabinets from Washington State College, Pullman, Wash., or Oregon State College, Corvallis, Oregon. You will have to write for the bulletins yourself as the colleges do not furnish us with a supply for distribution.

An excellent plan of a home freezer and how to build it is printed in last month's ELECTRICITY ON THE FARM.

Supplemental Farm Business

▶**Question:** *I was given a copy of your magazine (October 1942) and have just finished reading it.*

Was especially interested in the article "Country Sausage" by Caroline S. Coleman, and your note at bottom of article. If you have any pamphlets or more detailed information on the things mentioned in your note, I would appreciate you advising me how I can obtain this information. C. A. A., Md.

▶**Answer:** We have no pamphlets on the subject covered in my note following the article on "Country Sausage" in the October issue. There have been a number of articles in ELECTRICITY ON THE FARM on the subject of farm freezers and on how farmers have sold frozen strawberries and frozen broilers and hens which are always on hand in their farm freezers to supply a backdoor market.

The Department of Agriculture has a pamphlet on Smoked Turkeys, and I think you could also get a publication on different food uses of soy beans. Certain varieties when soaked until about ready to sprout, then dried and roasted are delicious.

The gallon jug milk business has been written up in our magazine With any of these enterprises, the main thing is to develop a first class fresh product that is clean and attractively packed. Start marketing it on a small scale and one customer will tell another and the business will develop. There have been many experiences of this kind.

Motor on Hand Churn

▶**Question:** *I would like to know how to operate a 1 gallon hand churn electrically. Motor size and size of pulleys?* A. V. R., Mo.

▶**Answer:** While it is possible to rig up gears and a driving mechanism for a one gallon hand churn, I am afraid the job would be either too crude to be useful or would cost you as much as a small electric churn. If you have an electric mixer, I would suggest that you arrange to put your churn beater on a special shaft which can be attached to the mixer. Run the mixer at medium or low speed.

Air Pump for Inflating Tires

▶**Question:** *I am in the market for a small air pump to pump up my tractor, wagon, truck and car tires with an electric motor. I live 6 mi. from town.* W. J. E., Ill.

▶**Answer:** If you want a reasonably priced compressor for inflating tires, I would suggest that you visit a junk yard or second hand machinery dealer and try to get a compressor from an old refrigeration machine. Just be sure that it is in reasonably good condition.

Mail order houses and auto supply stores have handled compressors, but I doubt if you can buy one now without a priority. If you can find a local dealer who has one on hand, he could sell it to you. Compressors made for reasonably large size paint sprayers would be satisfactory.

Basement Freezing Room

▶**Question:** *Is it practical to operate a freezing room and a cooling room from one unit? What size unit would be required for a freezing room 4 x 5 ft inside and a 4 x 6 ft cooling room? Is sawdust as good for insulation as rock wool? How thick should walls be? Should there be a dead air space between basement cement floor and wood floor of freezing room? Or, could I just use the cement basement floor? Where could I get information about type and size of freezing unit?*

L. J. H., Illinois

▶**Answer:** It is practical to operate a freezing room and cooling room from one compressor unit. It is being done on many farms. I can only make a rough estimate of the compressor size you will need as it will depend upon the type of construction, the temperatures you will hold and the location of your freezing cabinet. Assuming a six foot ceiling giving a freezing room of about 120 cu. ft. capacity and a cooling room of about 150 cu. ft. capacity, I would judge that you would need a compressor unit of about 1½ hp.

The insulating value of dry shavings is about three-fourths that of rock wool. Sawdust is not quite so good. Shavings and sawdust will both become damp because of condensation of moisture within the walls. Rock wool is quite impervious to moisture. If you use shavings or sawdust, they should be dry in the beginning and the walls should be lined with special asphalted paper to keep them as dry as possible. I would use about three times the thickness of either shavings or sawdust as of rock wool.

The thicker the walls, the less current you will use in keeping the box cold. Freezing compartment walls are usually made four or five inches thick where cork or rock wool is used and about 12 inches thick where shavings are used. The floor should have insulation about 25 percent thicker than the walls. It will not be sufficient to just have a board floor over your basement cement floor.

The Refrigeration Department, General Electric Company, Bloomfield, N. J., the Westinghouse Elec. & Mfg. Company, Pittsburgh, Pa., the Frigidaire Company of Dayton, Ohio, and the Kelvinator Company, Detroit, Mich., can all give you information about freezing units and coils if you will tell them your problem. Oregon State College, Corvallis, Oregon, and Washington State College, Pullman, Wash., both have bulletins on the subject of homemade freezing cabinets.

Truck Engine Heats Hay Hoist Manufacturers

▶**Question:** *I have a 1932 Chevrolet which I have made into a tractor. it has a dual transmission with truck rear axle and wheels. Everything works fine except the radiator which gets so hot that it boils all the time and in just a little bit the pump has all the water thrown out of the overflow or the filler cap. The radiator only holds about 2 gal. of water, but I have had it cleaned out and the pump works all right. Could you tell me what to do? Could you give me the address of a company which makes an electric hay hoist?*

F. B., Ohio

▶**Answer:** Gasoline trucks and automobiles are a little out of our line but I would guess from personal experience that your Chevrolet motor is overloaded which causes the radiator to boil as it does. Is your fan working properly drawing air through the radiator? The timing or gas mixture of your engine may be off somewhat causing it to heat more than it should. I think, however, the main trouble is that you are asking that automobile engine to do a lot heavier work than it was designed for and the continuous pulling causes it to heat. A larger radiator from an automobile junk yard might help you.

The Ireland Machine & Foundry Company, 12-14 State Street, Norwich, N. Y., makes hay hoists which are controlled by one lever. A. S. Ferrell & Company, Saginaw, Mich., and the Universal Hoist & Mfg. Company, Cedar Falls, Iowa, make several types of farm hay hoists.

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